

Claims

1. A reactor for performing a heat-conditioned catalytic reaction in a process fluid, said reactor comprising: plates that are arranged parallel to one another at a distance and that form flat channels with lateral boundary areas that face one another, wherein a portion of said channels contain a solid catalyst and carry a process fluid, and another portion of said channels carry a heat transfer medium in indirect heat contact with the process fluid, wherein said plates are flat or are provided with grooves or ribs and are coated at least partially with a catalyst on the surface that faces the process fluid.

2. A reactor according to claim 1, wherein said lateral boundary areas are jacket pieces, which form a pressure-resistant cuboid block with said channels, plates, and with collectors for the process fluid and for the heat transfer medium.

3. A reactor according to claim 1, wherein the channels which carry the process fluid contain corrugated or pleated sheets which form passages for the flow of process fluid.

4. A reactor according to claim 3, wherein said sheets are perforated and thereby provide flow connections between said passages.

5. A reactor according to claim 3, wherein said sheets are coated at least partially on both sides with catalyst material.

5 6. A reactor according to claim 1, wherein said catalyst layer contains a support medium.

7. A reactor according to claim 1, wherein said catalyst layer has a thickness of 1-500 μm .

8. A reactor according to claim 1, wherein said catalyst layer has a thickness of 10-100 μm .

10 9. A reactor according to claim 1, wherein said reactor is made of aluminum.

10. A reactor according to claim 1, wherein said reactor is made of steel or high-grade steel.

15 11. In a method of performing an endothermic or exothermic reaction within a reaction, the improvement wherein said reactor is according to claim 1.

12. A method according to claim 11, wherein said reaction is synthesis of methanol or synthesis of higher alcohols.

20 13. A method according to claim 11, wherein said reaction is hydrogenation of hydrocarbons.

14. A method according to claim 13, wherein said reaction is selective hydrogenation of C_2H_2 to C_2H_4 .

25 15. A method according to claim 13, wherein said reaction is non-selective hydrogenation of C_2H_4 to C_2H_6 .

16. A method according to claim 11, wherein said reaction is methanation or in the synthesis of methane.

17. A method according to claim 11, wherein said reaction is conversion of carbon monoxide.

18. A method according to claim 11, wherein said reaction is Fischer-Tropsch synthesis.

5 19. A method according to claim 11, wherein said reaction is epoxidation.

20. A method according to claim 19, wherein said reaction is synthesis of ethylene oxide.

10 21. A method according to claim 11, wherein said reaction is Claus reaction.

22. A method according to claim 11, wherein said reaction is direct oxidation of H_2S to sulfur.

23. A method according to claim 11, wherein said reaction is oxidation of SO_2 to SO_3 .

15 24. A method according to claim 11, wherein said reaction is synthesis of NH_3 .